What is a Provenance Pattern?

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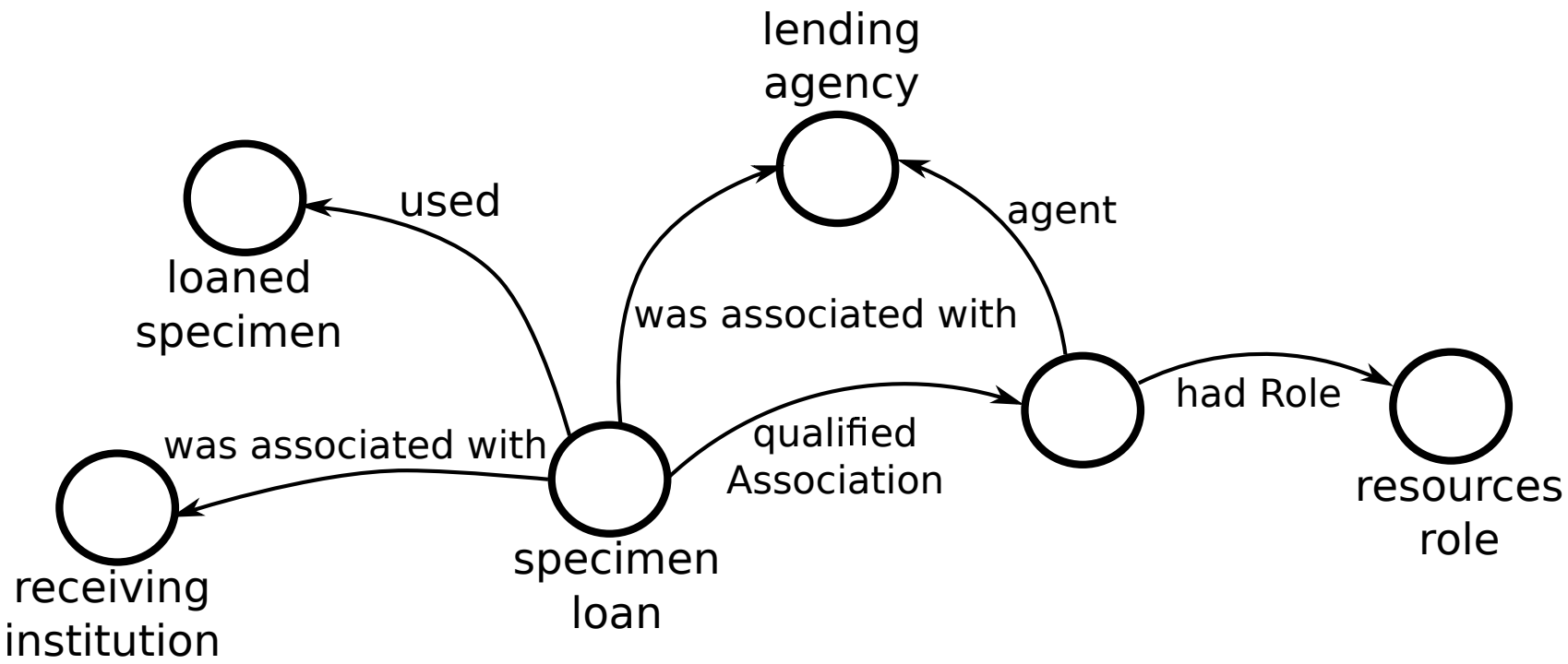
- Use case example from the TDWG WG: How should we represent agent roles in provenance documentation?
- Scenario: an agency lends a physical specimen to a researcher. How shall we document the agency's role in contributing to the research by providing the loan?
- We have IDs for the loaned specimen, the lending institution, and the receiving institution. We propose to reify the loan itself as a transaction, and role taxonomies like CRediT[1] provide standardized labels (like "resources role").

[1] http://docs.casrai.org/CRediT

Documenting agent roles using PROV



The PROV illustration

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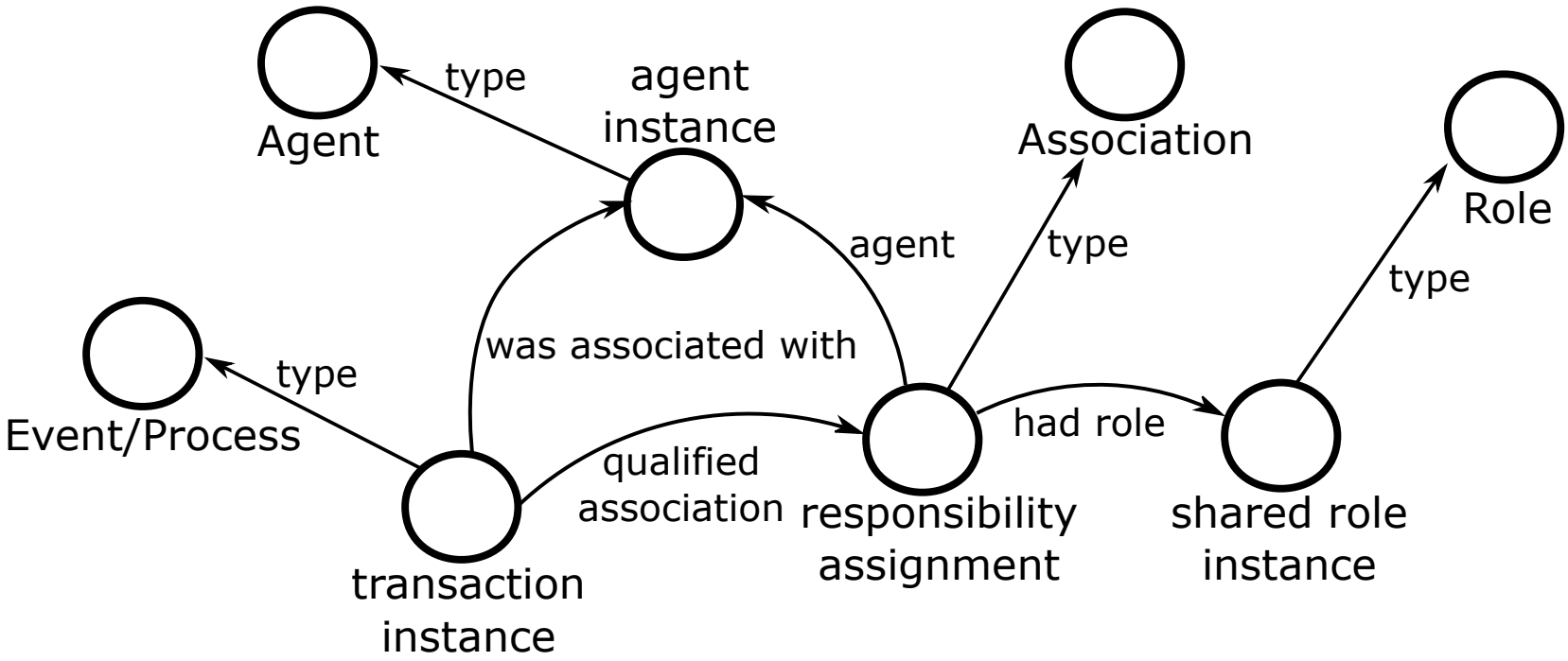
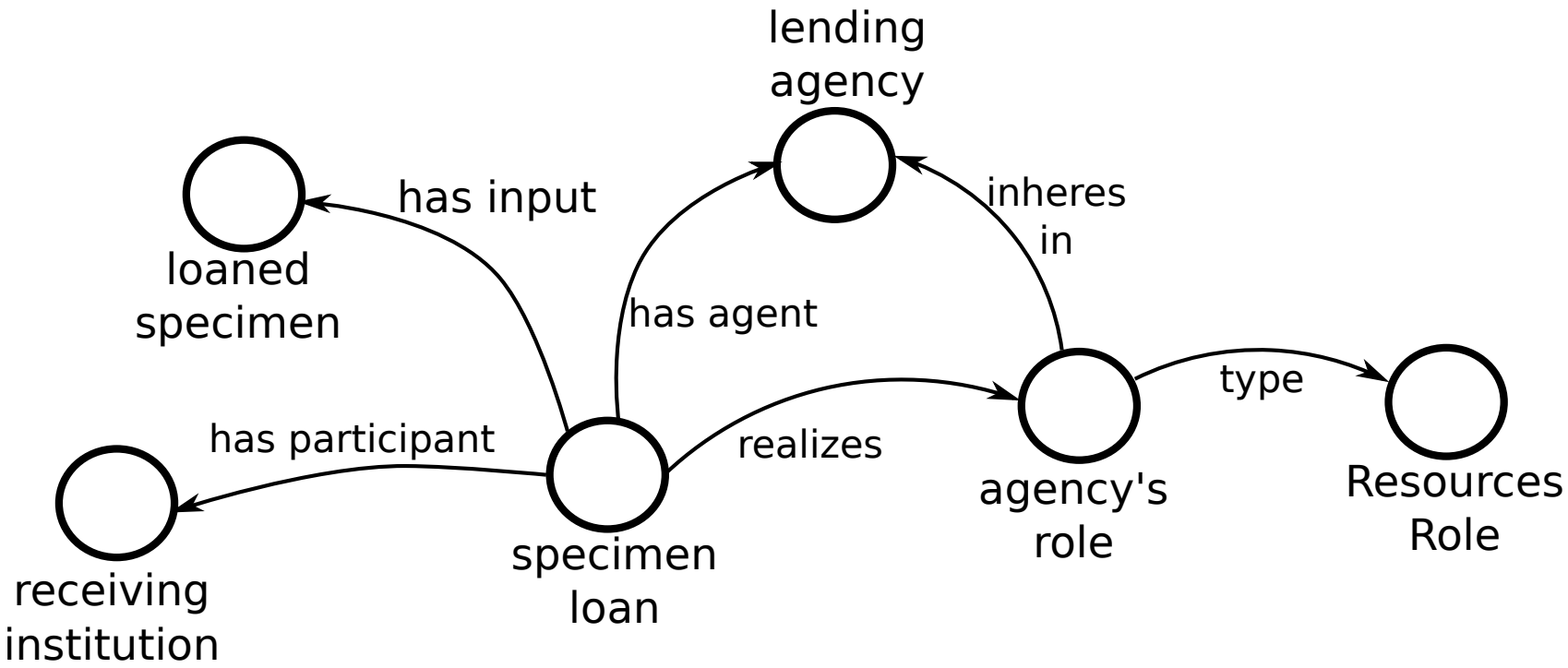
3. The **resources role** in this example is a *particular,* i.e., an instance of a **Role** class.
4. Different lending agencies could play that very same **resources role** in the context of other loan events.

Pattern 1: roles as shared social object instances



The VIVO-ISF illustration



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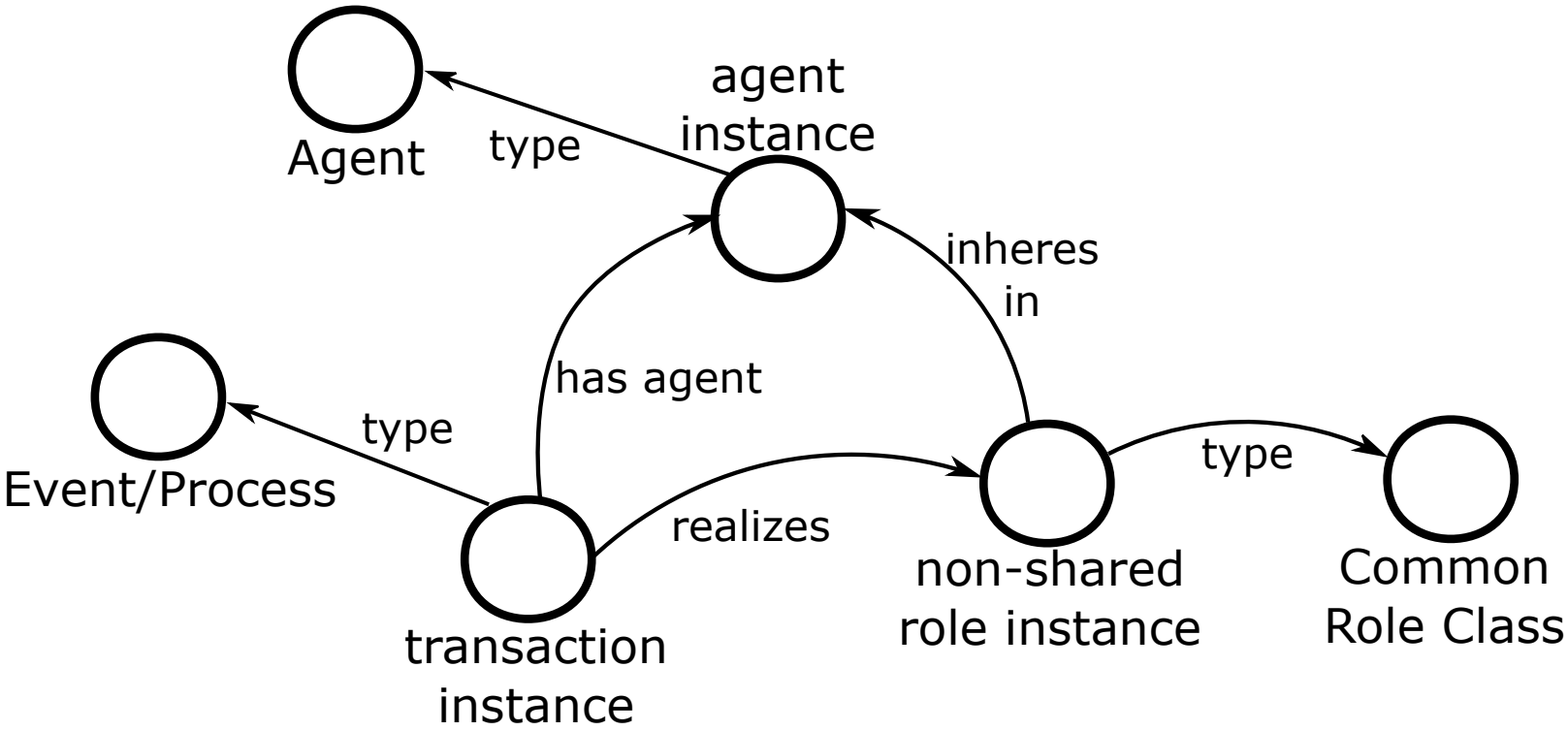
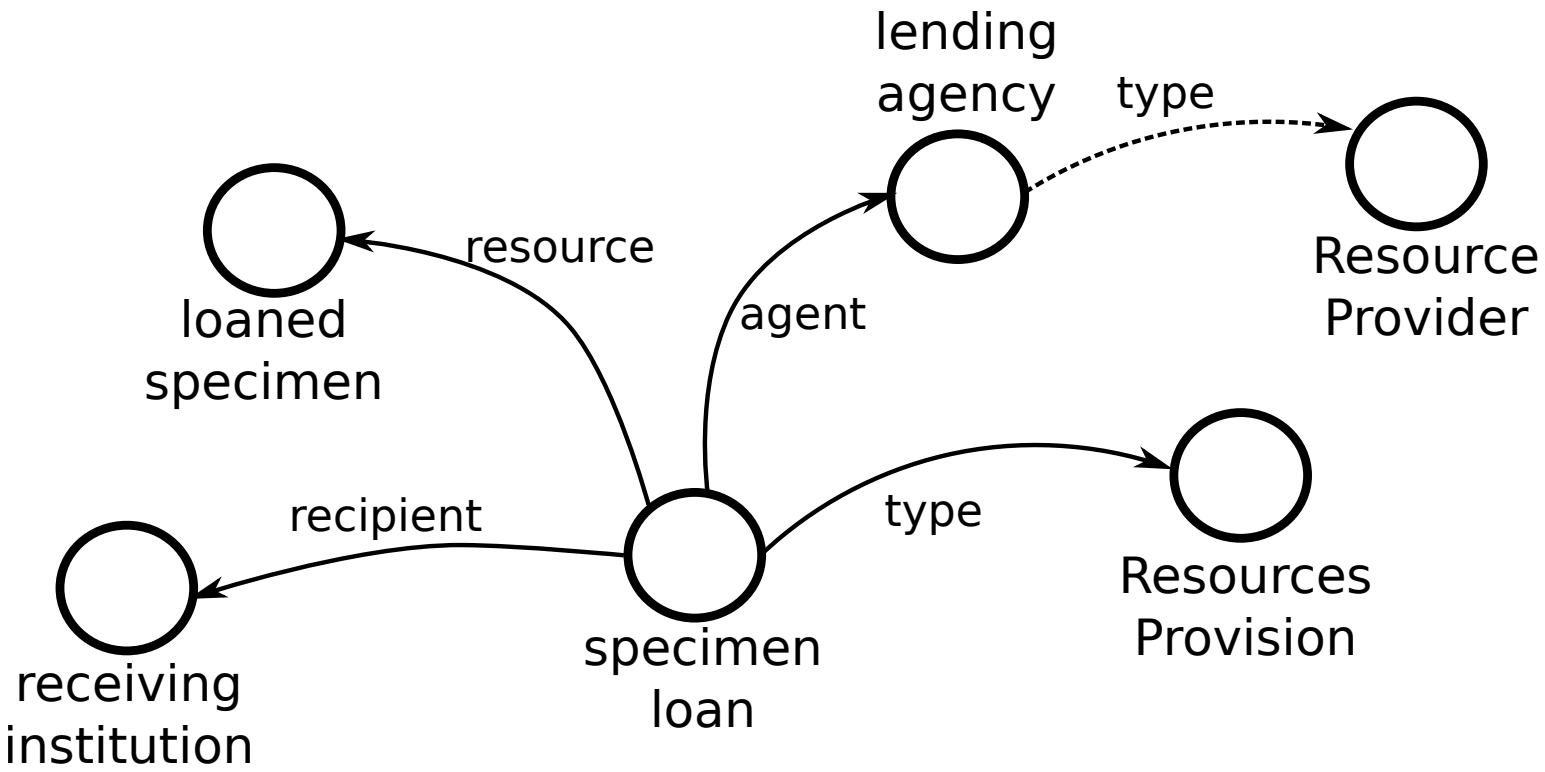
1. VIVO-ISF is based in BFO, the Basic Formal Ontology, which has an Aristotelian characterization of roles. Roles inhere within the agents that assume them.
2. The **Resources Role** in this example is not an instance or particular, but a *class.* That is because no role instance can inhere within two different agents. Two agent roles may have the same *class identity,* but not the same *individual identity.*

Pattern 2: roles as a common class identity



The contingent subclass pattern



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- Being a **Resource Provider** is understood as a class identity for the agents themselves. This class identity is deduced (dashed edge) from the agent's participation in a **Resources Provision** event.

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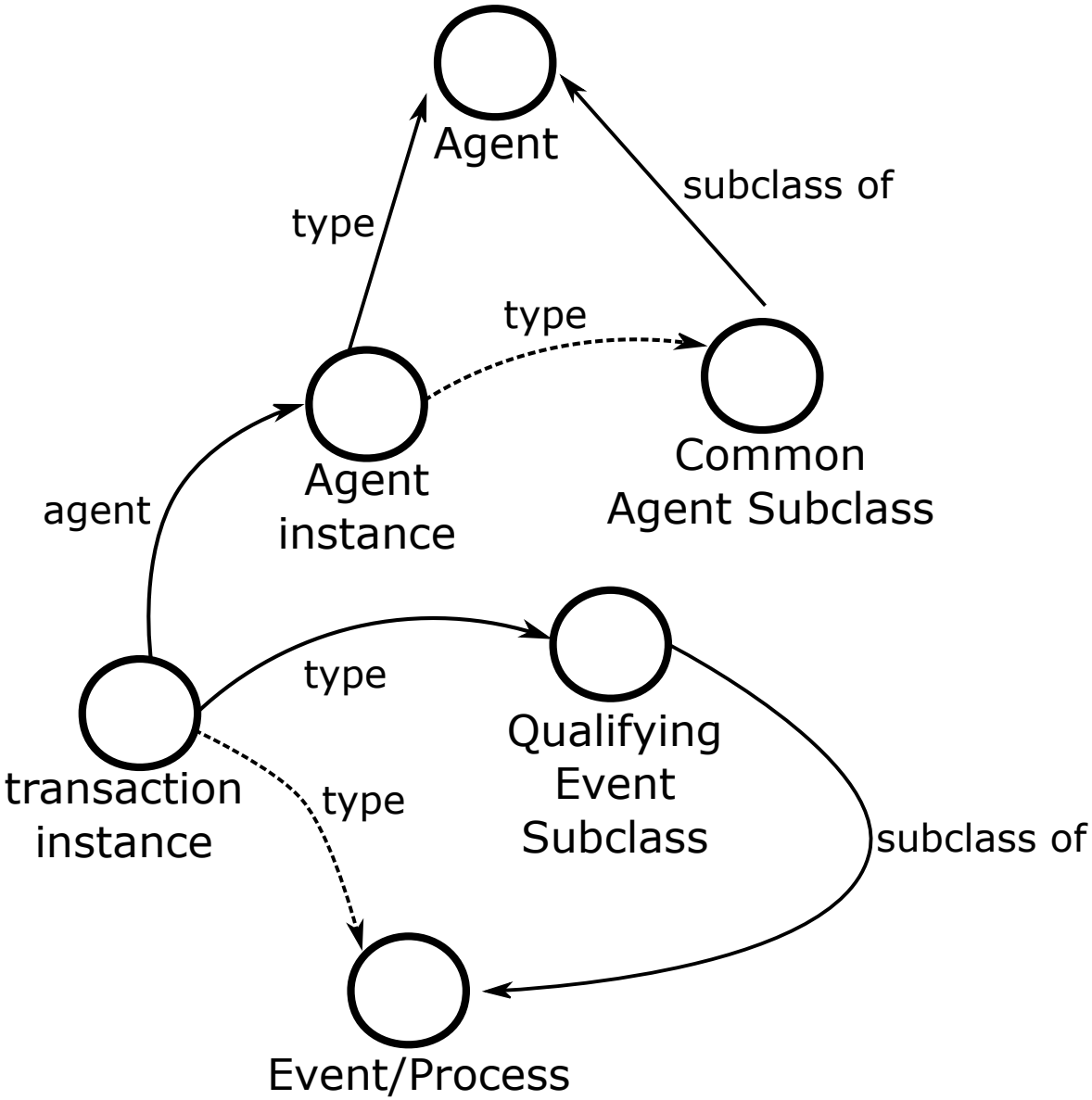
- Being a **Resource Provider** is understood as a class identity for the agents themselves. This class identity is deduced (dashed edge) from the agent's participation in a **Resources Provision** event.
- The participation that licenses this inference is not directly associated with the triggering event (as it was in the realization of the BFO role).

Pattern 3: contingent subclasses



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- Computational limitations or costs can also factor into a decision to adopt or reject a pattern.
- It's not always a matter of chosing one pattern over another: in the running example the bare facts are the same, only the interpretations differ.

Summary

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3. Our solution patterns typically don't match the abstraction level of the the use case, but we aim for a level that highlights key modeling and encoding decisions.
4. Patterns are linked in our database to associated use cases (and/or to other patterns at other levels of generality). For example, all three of the agent role patterns have direct counterparts for object or event roles (e.g., "instrument" or "replication," respectively).